

## HIGH PERFORMANCE ACTIVE AND PASSIVE STRUCTURES BASED ON SILICON MATERIAL BONDED TO SILICON CARBIDE.

### ABSTRACT OF THE DISCLOSURE

5           The present invention discloses and claims the Silicon Carbide based  
Silicon structure comprising: (1) a Silicon Carbide substrate, (2) a Silicon  
semiconductor material having a top surface, and either bonded to the Silicon  
Carbide substrate via the bonding layer, or epitaxially grown on the Silicon  
Carbide substrate; and (3) at least one separation plug formed in the Silicon  
10 semiconductor material. The single bonding layer, or either layer of the double  
bonding layer, is selected from the group consisting of : {a Silicon dioxide layer;  
a Silicon layer; a carbon layer; a Silicon germanium (SiGe) layer; a tungsten  
silicide layer; a titanium silicide layer; and a cobalt silicide layer}. The  
separation plug extends from the top surface of the Silicon semiconductor  
15 material into the Silicon Carbide substrate at a separation plug depth level, and is  
configured to block the coupling between at least two adjacent active/passive  
structures formed in the Silicon semiconductor material.

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